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Nutrient Credit Trading Ratio Study Report

Submitted to the State Water Control Board by the Department of Environmental Quality

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I. Introduction

Provisions of the Chesapeake Bay Watershed General Permit require that new or expanding point sources acquire allocations or credits to offset the entirety of their nutrient load (9VAC25-820-70). The permit regulation allows for the offsets to include certified nutrient credits “[s]ubject to a trading ratio of two pounds reduced for every pound to be discharged.”

An enactment clause in Senate Bill 77 (2012) and House Bill 176 (2012) requires “[t]hat by July 1, 2013, the State Water Control Board shall reevaluate its trading ratio for nutrient allocation acquisition pursuant to subdivision B 1 b of § 62.1-44.19:15 of the Code of Virginia, giving full consideration to similar trading ratios established by § 10.1-603.8:1 of the Code of Virginia, § 10.1-603.15:2 as added by this act, and trading programs in other Chesapeake Bay watershed states. The Board shall establish an advisory group of interested stakeholders for the purpose of receiving recommendations during the reevaluation regarding an appropriate ratio. If warranted based on the outcome of the reevaluation, the Board shall adopt a revised trading ratio for purposes of subdivision B 1 b of § 62.1-44.19:15 as soon as practicable following the completion of the reevaluation.”

Concerns have been expressed by the wastewater industry regarding the implications of the current ratio requirement. These concerns relate to the supply of credits that may be available and the implications for the cost of acquiring credits to offset loads. There is also concern about the difficulty in maintaining nutrient caps in the face of an expanding population and economy should offsets, in the number required under the permit, be scarce. The industry has also noted the differences between Virginia’s requirement and the trading ratios in place in other Chesapeake Bay Watershed states.

As directed by the General Assembly, the Department of Environmental Quality (DEQ) assembled a stakeholder committee to advise the agency on this issue. The roster of members of the study committee is attached as Appendix 1. Please note that membership on the committee does not necessarily imply endorsement of the recommendations contained in this report. The committee served to advise the agency on the issues raised in the enactment clause, not necessarily endorse any final recommendations by DEQ or the State Water Control Board.

All materials and documents related to the study are posted on DEQ's website at:
<http://www.deq.virginia.gov/Programs/Water/PermittingCompliance/PollutionDischargeElimination/NutrientTrading/TradingRatioStudy.aspx>

II. Trading Ratios

Nationally, trading ratios are a familiar feature of nutrient trading programs and vary from program to program (Robaudo and Gottlieb, 2011). The purposes range from dealing with inherent uncertainties in the efficiencies of certain nonpoint source management practices to accounting for the physiographic location of the practice to the separation of the practice from the discharge to water and other factors. In some programs, these factors are combined in a manner that effectively establishes a trading ratio, although the terminology may vary from program to program (Vogel and Szeptycki, 2012). Ratios of 2 to 1 or 3 to 1 or greater between nonpoint and point sources are not uncommon, however in programs in the Chesapeake Bay Watershed, 1.1 to 1 to 1.2 to 1 ratios exist. Although in many of these programs, trades with these smaller “uncertainty” ratios are discounted by the application of credit retirement requirements, delivery ratios or other factors.

Specific ratios for Chesapeake Bay watershed states are summarized in Part III of this report.

Current Virginia Law

In Virginia, nutrient credit trading ratios are established in both law and regulation. Provisions of the Chesapeake Bay Watershed General Permit require that new or expanding point sources acquire allocations or credits to offset the entirety of their nutrient load (9VAC25-820-70). A provision of the permit regulation allows for the offsets to include certified credits “[s]ubject to a trading ratio of two pounds reduced for every pound to be discharged.” Based on projections of nutrient loads from the wastewater sector, the need to offset loads with nonpoint source credits from new or expanding facilities may be some years away. As a result, this provision has not yet been used.

Other provisions of Virginia law also address trading ratios. The Code of Virginia establishes a 1 to 1 ratio for nonpoint to nonpoint source trading under the provisions of §[10.1-603.8:1](#).¹ relating to credits used to meet post-construction stormwater nutrient requirements. This ratio is established between nonpoint source credits and nonpoint source post-construction phosphorus loading requirements. Credits used for this purpose must be certified as “perpetual” and have,

¹ As a result of the 2013 legislation consolidating water quality programs, effective July 1, 2013, these provisions will be set forth at Va. Code § 62.1-44.15:35.

with one exception, involved conversion of land from agricultural uses to forest with permanent protection through an easement or some other instrument attached to the deed. Nonpoint source credits used to offset point source discharges are not required to be perpetual.

Section 62.1-44.19:15 D. of the Code of Virginia also specifies that documented credits derived from animal waste-to-energy facilities shall not be subject to a 2 to 1 trading ratio. To date, no credits have been certified from animal waste-to-energy facilities, so this provision of the Code has not been exercised.

A new provision of law that will be implemented following the development of regulations, calls for the permanent retirement of 5% of certified nonpoint source credits. *See* Va. Code § 10.1-603.15:2(B)(8).² It should be noted that retirement requirements are intended to achieve a net water quality improvement benefit, while the uncertainty trading ratio is intended to address the difference in certainty of performance between point and nonpoint source control practices and technologies. The Code of Virginia makes this distinction in the Nutrient Credit Trading Act which reads: “The regulations adopted pursuant to this section shall... (e) establish a credit retirement requirement whereby five percent of credits in the Chesapeake Bay Watershed are permanently retired at the time of certification pursuant to this section for the purposes of offsetting growth in unregulated nutrient loads.” (Va. Code 10.1-603.15:2 B.8)

III. Chesapeake Bay Basin States’ Ratios

West Virginia

West Virginia has developed policy and guidance related to nutrient trading in the Potomac River watershed but does not yet have an operating nutrient credit trading program. Guidance developed by the West Virginia Department of Environmental Protection called for a series of ratios that will be applied to any trade. The base ratio in West Virginia for NDPES permittees is 1.2 to 1. However, program guidance allows for a greater uncertainty ratio for some practices that “are not measured or have not been peer reviewed and approved by the Chesapeake Bay Program.” (West Virginia DEP)

The factors include an uncertainty ratio (applied only to nonpoint source to point source trades), and a “special concerns” ratio that may be applied to credits generated in watersheds deemed to have special water quality concerns. (West Virginia DEP, 2010). West Virginia does not specify a specific ratio for each trade. Rather, the ratio will vary for each approved use of credits, depending on the factors applied.

Maryland

Maryland does not have an uncertainty ratio for approved practices. However, an uncertainty ratio may be applied to certain categories of Best Management Practices (BMPs) specified in the program guidance. The categories include BMPs that are currently in use in the Chesapeake Bay

² As a result of the 2013 legislation consolidating water quality programs, effective July 1, 2013, these provisions will be set forth at Va. Code § 62.1-44.19:20(B)(8).

watershed but may still require additional scientific analysis and technical review or new technologies that are not yet widely used.

It should be noted that Maryland's use of nutrient credits is confined to offsetting an increase in loads from point or nonpoint source permitted activities. Credits are not available to meet any permit compliance obligations, so with the exception of an increased nutrient allocation provided to a sewage treatment plant which made connections from on-site systems, there have been no trades in Maryland involving nonpoint source generated credits.

As in West Virginia, there is no set ratio for each trade; rather ratios vary depending on the site specific circumstances of each generated credit. (Maryland, 2008)

Pennsylvania

Pennsylvania employs several ratios that reduce the credits available for sale including, delivery, edge of segment, and a trading ratio depending on the nature and location of the proposed credit-generating activity. The Department of Environmental Protection (DEP) also reserves the right to modify calculation procedures to account for uncertainty or other factors in the interest of water quality protection.

Based on an EPA review and the ongoing evolution on Pennsylvania's trading program, DEP has committed to review its current 1.1 to 1 ratio and modify its trading ratio after September 30, 2015 to conform to recommendations made by EPA in published Technical Memoranda. (DEP 12/19/2012).

Other Chesapeake Bay Jurisdictions

The remaining Chesapeake Bay states, Delaware and New York, have not yet developed trading programs. The District of Columbia is currently developing a "Stormwater Retention Credit Trading program" to allow additional flexibility in meeting new stormwater regulations; however its provisions are still under development and may or may not be relevant to the issues addressed in this report.

A Note about Delivery Factors:

Due to the natural attenuation of nutrients as they travel downstream, each state program in the Chesapeake Bay watershed applies a "delivery" factor to the credits generated depending on their proximity to the Chesapeake Bay based on versions of the Chesapeake Bay Program watershed model. Nutrient credits are discounted to account for this natural process in upstream regions and less so if the practice is closer to tidal waters. Currently, in Virginia, the delivery factor is applied depending on whether the location of the proposed practice is in, above, or below the fall line and the trading ratio follows the final results of the calculation should the credits be used to offset new or expanding point source loads. The current delivery factors are based on an older version of the Chesapeake Bay Program model and will change as a result of the current nutrient credit certification rulemaking.

IV. Uncertainty in Practice Performance

The ratio required for the use of credits to offset the loads of new or expanding facilities in Virginia is based on an “uncertainty” factor. It is well understood that the nutrients discharged from a wastewater treatment plant are easier to quantify based on monitoring and sampling. The efficiencies of many stormwater or agriculture practices are inherently uncertain and are affected by numerous factors including operation and maintenance, soil and slopes, proximity to water bodies, and weather (NAS 2011). Because of these variations, the National Academy of Sciences reports “BMP efficiencies are often derived from limited research or small-scale, intensive, field-monitoring studies in which they may perform better than they would in aggregate in larger applications, particularly at the watershed scale” (NAS 2011).

To some degree, these inherent uncertainties are addressed in the comprehensive evaluation of BMP efficiencies conducted for the Chesapeake Bay Program (NAS, 2011, p. 74). However, the NAS recommended continued attention to this issue and periodic revisions to BMP efficiencies based on new research and information. The comprehensive analysis undertaken on behalf of the Chesapeake Bay Program clearly recognized these uncertainties and attempted to offer “conservative” efficiencies (Simpson and Weammert, 2009). The Chesapeake Bay Program analysis recognized the limitations of current literature and the necessity, in some cases, of using professional experience and judgment to establish practice efficiencies (Simpson and Weammert, 2009). The consensus of the literature on this issue is that precise certainty regarding the performance of BMPs is not possible.

In his presentation to the committee, Dr. Simpson noted the following general rules regarding uncertainty in the assignment of efficiencies to nonpoint source practices. He noted that there are wide variations in the amount of research and data for BMPs and a wide variation in reported efficiencies for the same BMP. He recognized that uncertainty remains for even those BMPs with the most data because the research techniques used might be from only one hydrologic or geomorphic setting. Data is also collected at the plot or transect level rather than at a watershed scale and therefore his conclusion was that even the knowledge base for the “most certain” BMPs have “substantial uncertainty.” (Simpson, 2013)

Related to the issue of uncertainty is the ongoing verification that a practice is in place and being maintained. Verifying the existence and the operation and maintenance of any particular practice is important to understand the overall reductions that might be expected over its useful service life (Simpson and Weammert, 2009) (Dubin, 2013). Unless practices are verified in some fashion, it is difficult to confirm whether presumed reductions of nutrients are taking place.

V. Current Regulatory and Administrative Actions

There is a great deal of activity at the state and regional levels related to nutrient credits, their certification and use, that may influence the design and requirements of Virginia's nutrient credit trading programs.

Amendments to the Chesapeake Bay Watershed General Permit

Based on revisions to the State Water Control Law by the General Assembly in 2012, new or expanding point source facilities have an array of methods to offset their nutrient loads. Prior to the 2012 changes, facilities could acquire allocations from other point source facilities, from nonpoint sources or from the Water Quality Improvement Fund. New or expanding facilities may now acquire allocations or credits from other point sources or credits certified under the new regulations discussed below. This offers some additional flexibility for new or expanding facilities to offset their nutrient loads.

EPA Technical Memorandum

EPA has committed to developing a series of technical memoranda related to trading and offset credit issues. According to a draft schedule published by the Chesapeake Bay Program office (EPA, March 14, 2013), a technical memorandum on "Trading Ratios for Uncertainty" will be published in the second quarter of 2013 and finalized in the third quarter. However, EPA cautions that the dates for publication are "target dates" and may extend further into 2013 or 2014.

Virginia Nutrient Credit Certification Regulations

"The Nutrient Trading Act", passed in the 2012 session of the General Assembly required the promulgation of regulations to certify nutrient credits from nonpoint source practices. The rulemaking process has begun and regulations are currently being drafted for board review and adoption. The results of this rulemaking will result in the establishment of baseline practices (practices that must be in place before credits can be generated), calculation procedures, verification requirements, reporting, and operation and maintenance, among others. An overview of the rulemaking process and related materials are currently available at: http://www.dcr.virginia.gov/laws_and_regulations/lr6.shtml³

³ The web address for these materials will change beginning July 1, 2013 to the Department of Environmental Quality website. Elements of the rulemaking can also be found at <http://townhall.virginia.gov/L/ViewAction.cfm?actionid=3760>

Chesapeake Bay Program BMP Verification Committee

Based on the recommendations contained in the National Academy of Sciences Report, the EPA's Chesapeake Bay Program assembled a committee to recommend standards for verification of BMPs by the Chesapeake Bay jurisdictions. The committee is in the midst of its deliberations. For information regarding the committee's work visit:

http://www.chesapeakebay.net/groups/group/best_management_practices_bmp_verification_committee

VI. Agency Recommendation

Based on the research done for this report and discussion with stakeholders, DEQ recommends that there should be no change in the current 2 to 1 trading ratio at this time. We acknowledge the concerns of the wastewater industry and we recognize that Virginia's required ratio is greater than those of some of our neighboring states. We would note that at least one state, Pennsylvania, has committed to review and possibly change their current ratio to conform to any recommendation EPA might make in its technical memorandum.

Because this is an important issue with implications for the ability of waste water treatment plants to accommodate future growth under nutrient caps imposed by Virginia law and the Chesapeake Bay TMDL, DEQ recommends that this issue remain on the agency's agenda for future consideration and will report to the board by July 1, 2014 on the status of this issue. Prior to potential future recommendations or reports to the State Water Control Board, DEQ will consult with the public and stakeholders. We believe that it is prudent to evaluate the final Uncertainty Ratio Technical Memorandum by EPA prior to revisiting this issue. EPA has oversight of VPDES permits that may use credits to meet nutrient loading requirements, as a result, a ratio that conflicts with that recommended by EPA may put such permits in jeopardy of additional scrutiny that may result in delays in permit issuance or renewal.

Chesapeake Bay Program standards currently under development for verification of best management practices may also impact the "credit" given to practices, particularly those that have operation and maintenance requirements over time.

We also believe that the current rulemaking on certification of nutrient credits in Virginia should be completed prior to consideration of a possible change. This regulatory action will include certification methodology, monitoring and maintenance, financial assurance, among other things, that will help clearly define the nutrient credit value of proposed practices. These regulations also will address certainty and verification that will inform the type of ratio that might ultimately be in place in Virginia.

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http://www.deq.virginia.gov/Portals/0/DEQ/Water/PollutionDischargeElimination/VANPSTradingManual_2-5-08.pdf

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West Virginia Water Quality Nutrient Credit Trading Program Guidance – West Virginia Department of Environmental Protection, available at:
<http://www.wri.nrcce.wvu.edu/programs/pwqb/index.cfm>

APPENDIX I

Chesapeake Bay Watershed General Permit – Trading Ratio Study Stakeholder Committee Established October 2012 by the Department of Environmental Quality

Regulated Community

Chris Pomeroy, VAMWA
Jim Pletl, HRSD

Local Government

Fran Geissler, James City County (Alternate: Whitney Katchmark, Hampton Roads Planning District Commission)

Conservation Organizations

Nicole Rovner, The Nature Conservancy
Jeff Kelble, Shenandoah River Keeper
Ann Jennings, Chesapeake Bay Commission
Jacob Powell, Virginia Conservation Network/Choose Clean Water Coalition

Agricultural Organizations

Wilmer Stoneman, Virginia Farm Bureau

Consultants

Joe Maroon, Maroon Consulting
Kevin Seaford, Golder Associates
Peter Brooks, PMBA Environmental Services
Tom Simpson, Water Stewardship
Brent Fults, Chesapeake Bay Nutrient Land Trust

Government

Jack Frye, Chesapeake Bay Commission

DEQ

Russ Baxter
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Stephanie Martin
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